Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

Claim 1 (currently amended): A process for providing a hydrogen-containing gas stream to at least one fuel cell anode, comprising:

~~providing a hydrogen-containing feed gas stream that includes at least one contaminant;~~

introducing ~~the~~ a hydrogen-containing feed gas stream that includes at least one contaminant into an adsorption module having at least a first adsorbent and at least one second material selected from a second adsorbent, a steam reforming catalyst, ~~and~~ or a water gas shift reaction catalyst, wherein the first adsorbent and the second adsorbent are chemically distinct and at least one of the first adsorbent or the second adsorbent preferentially adsorbs the contaminant in the hydrogen-containing feed gas stream to produce a purified hydrogen-containing gas stream; and

introducing the purified hydrogen-containing gas stream to the fuel cell anode.

Claim 2 (currently amended): The process according to claim ~~2~~1, wherein the contaminant is carbon monoxide and at least one of the first adsorbent or second adsorbent comprises a carbon monoxide-selective adsorbent.

Claim 3 (currently amended): The process according to claim 2, wherein the carbon monoxide-selective adsorbent is ~~selected from~~ Na-LSX, Ca-LSX, Li-LSX, Li-exchanged chabazite, Ca-exchanged chabazite, Sr-exchanged chabazite, a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof.

Claim 4 (original): The process according to claim 1, further comprising introducing the hydrogen-containing feed gas stream into the adsorption module at a temperature of about 80°C to about 200°C.

Claim 5 (original): The process according to claim 1, further comprising at least one additional adsorbent.

Claim 6 (original): The process according to claim 1, wherein the adsorption module comprises a rotary pressure swing adsorption module.

Claim 7 (original): The process according to claim 1, wherein the fuel cell comprises a polymer electrolyte membrane fuel cell.

Claim 8 (original): The process according to claim 1, further comprising providing a reforming or partial oxidation system that produces the hydrogen-containing feed gas stream.

Claim 9 (currently amended): The process according to claim 2, wherein the carbon monoxide-selective adsorbent is ~~selected from~~ a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof.

Claim 10 (original): The process according to claim 1, wherein the first adsorbent preferentially adsorbs carbon dioxide compared to water vapor.

Claim 11 (original): The process according to claim 1, wherein the first adsorbent comprises an alkali-promoted material and at least one of the steam reforming catalyst and the water gas shift reaction catalyst is present.

Claim 12 (currently amended): The process according to claim 11, wherein the steam reforming catalyst is ~~selected from~~ a methanol steam reforming catalyst or a methane steam reforming catalyst.

Claim 13 (currently amended): A process for providing a hydrogen-containing gas stream to at least one fuel cell anode, comprising:

~~providing~~ introducing a hydrogen-containing feed gas stream that includes at least a first contaminant and at least a second contaminant into a first separation zone and a second separation zone;

preferentially separating at least a portion of the first contaminant from the hydrogen-containing feed gas stream in ~~a~~ the first separation zone;

preferentially separating at least a portion of the second contaminant from the hydrogen-containing feed gas stream in ~~a~~ the second separation zone; and

introducing the resulting purified hydrogen-containing gas stream to the fuel cell anode.

Claim 14 (original): The process according to claim 13, wherein the first contaminant is water vapor and the second contaminant is at least one carbon oxide.

Claim 15 (original): The process according to claim 13, wherein the preferential separation of the first contaminant occurs prior to the preferential separation of the second contaminant.

Claim 16 (original): The process according to claim 13, wherein the first separation zone comprises a first adsorbent bed and the second separation zone comprises a second adsorption bed.

Claim 17 (original): The process according to claim 13, wherein the preferential separation of the first and second contaminants occurs via adsorption.

Claim 18 (original): The process according to claim 13, wherein the hydrogen-containing feed gas stream is produced by a reforming or partial oxidation system.

Claim 19 (original): The process according to claim 13, wherein the fuel cell comprises a polymer electrolyte membrane fuel cell.

Claim 20 (original): The process according to claim 13, further comprising preferentially separating at least one additional contaminant in at least one additional separation zone.

Claim 21 (original): The process according to claim 20, wherein water vapor is preferentially separated in the first separation zone, carbon dioxide is preferentially separated in the second separation zone, and carbon monoxide is separated in a third separation zone.

Claim 22 (original): The process according to claim 21, wherein the first separation zone comprises a desiccant, the second separation zone comprises a zeolite, and the third separation zone comprises a zeolite.

Claim 23 (original): The process according to claim 13, wherein the first or second contaminant comprises carbon monoxide and the process further comprises reacting the carbon monoxide with water vapor in the first or second separation zones.

Claim 24 (currently amended): A process for providing a hydrogen-containing gas stream to at least one fuel cell anode, comprising:

~~providing a hydrogen-containing feed gas stream that includes at least a first contaminant and at least a second contaminant;~~

contacting ~~the~~ a hydrogen-containing feed gas stream that includes at least a first contaminant and at least a second contaminant with at least a first adsorbent and at least a second adsorbent under conditions sufficient to separate at least a portion of the first contaminant and at least a portion of the second contaminant from the hydrogen-containing feed gas stream; and

introducing the resulting purified hydrogen-containing gas stream to the fuel cell anode.

Claim 25 (currently amended): A process for separating carbon monoxide from a hydrogen-containing gas stream that is provided to at least one fuel cell anode, comprising:

~~providing~~ introducing a hydrogen-containing feed gas stream that includes carbon monoxide into at least one rotary pressure swing adsorption module,[[;]] wherein the ~~providing at least one~~ rotary pressure swing adsorption module ~~that~~ includes at least one adsorbent selected from Na-LSX, Ca-LSX, Li-LSX, Li-exchanged chabazite, Ca-exchanged chabazite, Sr-exchanged chabazite, a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof;

~~introducing the hydrogen-containing feed gas stream into the rotary pressure swing module to separate~~ separating at least a portion of the carbon monoxide from the hydrogen-containing feed gas stream; and

introducing the resulting purified hydrogen-containing gas stream into the fuel cell anode.

Claim 26 (original): The process according to claim 25, wherein the adsorbent comprises a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof.

Claim 27 (currently amended): A process for providing a hydrogen-containing gas stream to at least one fuel cell anode, comprising:

~~providing a hydrogen-containing gas stream that includes carbon monoxide;~~

introducing ~~the~~ a hydrogen-containing gas stream that includes carbon monoxide into a pressure swing adsorption module that includes at least one carbon monoxide-selective adsorbent to produce a purified hydrogen-containing gas stream; and

introducing the purified hydrogen-containing gas stream to the fuel cell anode.

Claim 28 (original): A process according to claim 27, wherein the carbon monoxide-selective adsorbent comprises a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof.

Claim 29 (currently amended): A process for providing a hydrogen-containing gas stream to at least one fuel cell anode, comprising:

~~providing an oxygen-enriched gas stream;~~

providing a mixture of ~~the~~ an oxygen-enriched gas stream and a fuel in an autothermal reforming or partial oxidation reactor to produce a hydrogen-containing gas stream that includes at least one carbon oxide contaminant;

separating at least a portion of the carbon oxide contaminant from the hydrogen-containing gas stream; and

introducing the resulting purified hydrogen-containing gas stream into the fuel cell anode.

Claim 30 (original): The process according to claim 29, further comprising providing a pressure swing adsorption module for producing the oxygen-enriched gas stream.

Claim 31 (currently amended): An electrical current generating system comprising:

a hydrogen-containing gas source;

at least one adsorption module that can at least partially purify the hydrogen-containing gas, wherein the adsorption module includes at least a first adsorbent and at least one second material selected from a second adsorbent, a steam reforming catalyst, ~~and~~ or a water gas shift reaction catalyst, the first adsorbent and the second adsorbent being chemically distinct; and

at least one fuel cell defining an anode inlet that can receive the purified hydrogen-containing gas stream from the adsorption module.

Claim 32 (original): The system according to claim 31, wherein the hydrogen-containing gas source comprises a reformer or partial oxidation reactor.

Claim 33 (original): The system according to claim 31, wherein the adsorption module comprises a rotary pressure swing adsorption module.

Claim 34 (original): The system according to claim 31, wherein the first adsorbent is disposed in a first zone and the second material is disposed in a second zone.

Claim 35 (original): The system according to claim 34, wherein the first zone and the second zone are disposed adjacently along a hydrogen-containing gas flow path defined in the adsorption module.

Claim 36 (original): The system according to claim 31, further comprising an anode recirculation conduit fluidly communicating between a fuel cell anode outlet and an inlet defined in the adsorption module.

Claim 37 (original): The system according to claim 31, wherein at least one of the first adsorbent or second adsorbent comprises a carbon monoxide-selective adsorbent.

Claim 38 (currently amended): The system according to claim 37, wherein the carbon monoxide-selective adsorbent is ~~selected from~~ Na-LSX, Ca-LSX, Li-LSX, Li-exchanged chabazite, Ca-exchanged chabazite, Sr-exchanged chabazite, a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof.

Claim 39 (currently amended): The system according to claim 31, wherein the steam reforming catalyst or the water gas shift reaction catalyst is ~~selected from~~ a Cu-ZnO catalyst, a transition metal carbonyl complex catalyst, or a catalyst comprising a transition group metal inserted into a zeolite cage.

Claim 40 (original): The system according to claim 34, further comprising at least one additional zone of at least one additional adsorbent.

Claim 41 (original): The system according to claim 31, wherein the first adsorbent preferentially adsorbs carbon dioxide compared to water vapor and at least one of the steam reforming catalyst or the water gas shift reaction catalyst is present.

Claim 42 (original): The system according to claim 41, wherein the first adsorbent comprises an alkali-promoted material.

Claim 43 (currently amended): The system according to claim 31, wherein the carbon monoxide-selective adsorbent is ~~selected from~~ a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof.

Claims 44-86 (canceled).

Claim 87 (new): The system according to claim 40, wherein the first adsorbent comprises a desiccant, the second adsorbent comprises a zeolite, and the additional adsorbent comprises a zeolite.

Claim 88 (new): The system according to claim 31, wherein at least one of the first adsorbent or second adsorbent comprises a zeolite, an activated carbon, or a Cu(I)-containing material.

Claim 89 (new): The system according to claim 32, wherein the reformer or partial oxidation reactor comprises a first burner and a second burner.

Claim 90 (new): The system according to claim 89, wherein the first burner receives an exhaust gas from the adsorption module and the second burner receives a hydrocarbon fuel.

Claim 91 (new): An electrical current generating system comprising:

a hydrogen-containing gas source;

at least one pressure swing adsorption module fluidly coupled to the hydrogen-containing gas source, the pressure swing adsorption module including at least one carbon monoxide-selective adsorbent; and

at least one fuel cell anode fluidly coupled to the pressure swing adsorption module.

Claim 92 (new): The system according to claim 91, wherein the carbon monoxide-selective adsorbent is a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof.

Claim 93 (new): A system for supplying hydrogen gas to a fuel cell anode, comprising:

a hydrogen gas generating system that includes an outlet for discharging a hydrogen-containing gas that includes at least a first contaminant and a second contaminant;

a first contaminant separation zone that fluidly communicates with the outlet of the hydrogen gas generating system;

at least one second contaminant separation zone that fluidly communicates with the first contaminant separation zone and includes an outlet for discharging a purified hydrogen gas; and

at least one fuel cell anode that fluidly communicates with the outlet for the second contaminant separation zone.

Claim 94 (new): The system according to claim 93, wherein the hydrogen gas generating system comprises a reformer or partial oxidation reactor and at least one of the first contaminant or second contaminant comprises a carbon oxide.

Claim 95 (new): The system according to claim 93, wherein the first contaminant separation zone comprises a first adsorbent and the second contaminant separation zone comprises a second adsorbent.

Claim 96 (new): The system according to claim 95, wherein the first contaminant separation zone and the second contaminant separation zone are disposed within a rotary pressure swing adsorption module.

Claim 97 (new): A system for supplying hydrogen gas to a fuel cell anode, comprising:

a hydrogen-containing gas source;

at least one rotary pressure swing adsorption module that can at least partially purify the hydrogen-containing gas, wherein the rotary pressure swing adsorption module includes at least one adsorbent selected from Na-LSX, Ca-LSX, Li-LSX, Li-exchanged chabazite, Ca-exchanged chabazite, Sr-exchanged chabazite, a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof; and

at least one fuel cell having an anode inlet that can receive the purified hydrogen-containing gas stream from the rotary pressure swing adsorption module.

Claim 98 (new): The system according to claim 97, wherein the adsorbent is a material that includes a Cu(I)-containing material, a Ag(I)-containing material, or a mixture thereof.

Claim 99 (new): An electrical current generating system comprising:

at least one first pressure swing adsorption module having an outlet for discharging an oxygen-enriched gas stream;

an autothermal reforming or partial oxidation reactor that can combust fuel and the oxygen-enriched gas stream to produce a hydrogen-containing gas;

at least one second pressure swing adsorption module that can at least partially purify the hydrogen-containing gas; and

at least one fuel cell having an anode inlet that can receive the purified hydrogen-containing gas from the second pressure swing adsorption module.

Claim 100 (new): A process for providing a hydrogen-containing gas stream and an oxygen-enriched gas stream to a fuel cell, comprising:

providing at least one first pressure swing adsorption module that produces an oxygen-enriched gas stream, the first pressure swing adsorption module including at least a first compressor or first vacuum pump;

providing at least one second pressure swing adsorption module that produces a purified hydrogen gas stream and a separation exhaust gas stream, the second pressure swing adsorption module including at least a second compressor or second vacuum pump;

introducing the oxygen-enriched gas stream and the purified hydrogen gas stream into a fuel cell; and

introducing the separation exhaust gas stream as a fuel into a combustion engine for driving at least the first compressor, first vacuum pump, second compressor, second vacuum pump, or an electric generator.

Claim 101 (new): The process according to claim 100, further comprising mixing a portion of the purified hydrogen gas stream with the separation exhaust gas stream as a fuel for the combustion engine.

Claim 102 (new): The process according to claim 100, wherein the fuel cell produces a cathode exhaust gas stream that includes water and the process further comprises cooling the combustion engine with the water from the cathode exhaust gas stream.

Claim 103 (new): The process according to claim 102, further comprising vaporizing the water from the combustion engine and introducing the resulting water vapor into a reformer that produces the hydrogen-containing gas feed stream.

Claim 104 (new): The process according to claim 100, wherein the combustion engine produces an engine exhaust gas stream and the process further comprises heating a hydrogen gas generating system with the engine exhaust gas stream.

Claim 105 (new): The process according to claim 100, further comprising:

mixing liquid water and a hydrocarbon fuel stream resulting in a coolant mixture;

introducing the coolant mixture into a coolant jacket juxtaposed with the combustion engine;

vaporizing the coolant mixture to form a steam/fuel vapor mixture;

subjecting the steam/fuel vapor mixture to reaction conditions sufficient for generating a hydrogen-containing gas stream; and

introducing the hydrogen-containing gas stream into the second pressure swing adsorption module.

Claim 106 (new): A process for providing a hydrogen-containing gas stream to a fuel cell, comprising;

mixing liquid water and a hydrocarbon fuel stream resulting in a coolant mixture;

introducing a coolant mixture into a coolant passage defined in a fuel cell wherein the fuel cell also defines an anode inlet for receiving a hydrogen-containing gas stream;

vaporizing the coolant mixture to form a steam/fuel vapor mixture;

subjecting the steam/fuel vapor mixture to reaction conditions sufficient for generating a hydrogen-containing gas stream;

purifying the hydrogen-containing gas stream; and then

introducing the hydrogen-containing gas stream into the fuel cell anode inlet.

Claim 107 (new): The process according to claim 106, wherein the hydrocarbon fuel stream comprises methanol, ethanol, or a mixture thereof.

Claim 108 (new): The process according to claim 106, wherein the vaporizing of the coolant mixture comprises flash evaporating of the coolant mixture.

Claim 109 (new): The process according to claim 106, wherein the purification of the hydrogen-containing gas stream occurs via pressure swing adsorption.

Claim 110 (new): The process according to claim 106, wherein the steam/fuel vapor mixture is subjected to reforming or partial oxidation to generate the hydrogen-containing gas stream.

Claim 111 (new): The process according to claim 106, wherein the fuel cell further defines a cathode outlet for discharging a cathode exhaust gas stream that includes cathode water vapor, the process further comprising condensing at least a portion of the cathode water vapor, separating the resulting liquid water stream from the cathode exhaust gas stream, and mixing the liquid water stream with the hydrocarbon fuel stream.

Claim 112 (new): An electrical current generating system, comprising:

at least one pressure swing adsorption module that includes a first outlet for discharging a purified hydrogen gas and a second outlet for discharging a separation exhaust gas;

at least one fuel cell defining an anode inlet that fluidly communicates with the first outlet of the pressure swing adsorption module; and

a combustion engine defining a fuel inlet that fluidly communicates with the second outlet of the pressure swing adsorption module.

Claim 113 (new): The system according to claim 112, wherein the hydrogen gas separation module comprises a rotary pressure swing adsorption module.

Claim 114 (new): The system according to claim 112, further comprising at least one first pressure swing adsorption module that includes an outlet for discharging an oxygen-enriched gas stream and at least one compressor or pump, wherein a shaft coupled to the combustion engine drives at least the compressor or pump.

Claim 115 (new): The system according to claim 112, wherein the fuel cell further defines a cathode outlet for discharging a cathode exhaust gas stream that includes water, the

combustion engine further includes a cooling jacket, and the system further comprises a conduit fluidly communicating between the fuel cell cathode outlet and the combustion engine cooling jacket.

Claim 116 (new): The system according to claim 112, further comprising a hydrogen gas generating system that fluidly communicates with the hydrogen gas separation module, wherein the hydrogen gas generating system comprises a reformer or partial oxidation reactor and the combustion engine further includes a cooling jacket that defines an outlet for a water stream that fluidly communicates with the reformer or partial oxidation reactor.

Claim 117 (new): The system according to claim 112, wherein the fuel cell comprises a polymer electrolyte membrane fuel cell.

Claim 118 (new): An electrical current generating system, comprising:

a fuel cell defining an anode inlet for receiving a hydrogen-containing gas stream, and a coolant passage having a coolant inlet and a coolant outlet;

a water source fluidly communicating with the coolant inlet;

a hydrocarbon fuel source fluidly communicating with the coolant inlet;

a hydrogen gas generating module that includes an outlet for discharging a hydrogen-containing gas stream and a fuel inlet that fluidly communicates with the coolant outlet; and

a first conduit fluidly communicating between the hydrogen gas generating module outlet and the fuel cell anode inlet, and with a first pressure swing adsorption module for purifying the hydrogen-containing gas stream that is positioned between the hydrogen gas generating module outlet and the fuel cell anode inlet.

Claim 119 (new): The system according to claim 118, wherein the hydrocarbon fuel comprises methanol, ethanol, or a mixture thereof.

Claim 120 (new): The system according to claim 118, wherein the first pressure swing adsorption module comprises a rotary pressure swing adsorption module.

Claim 121 (new): The system according to claim 118, further comprising a second pressure swing adsorption module that includes an outlet for discharging an oxygen-enriched stream, and a third conduit fluidly communicating between the second pressure swing adsorption module outlet and a fuel cell cathode inlet.

Claim 122 (new): The system according to claim 121, wherein the second pressure swing adsorption module comprises a rotary pressure swing adsorption module.

Claim 123 (new): The system according to claim 118, wherein the fuel cell further defines a cathode outlet for discharging a cathode exhaust gas stream, and the system further comprises a second conduit fluidly communicating between the fuel cell cathode outlet and the coolant inlet.

Claim 124 (new): A process for providing a hydrogen-containing gas stream to a fuel cell, wherein the fuel cell defines a coolant passage, an anode inlet for receiving a hydrogen-containing gas stream, and a cathode outlet for discharging a cathode exhaust gas stream that includes cathode water vapor, the process comprising;

mixing liquid water and a hydrocarbon fuel stream resulting in a coolant mixture;

introducing the coolant mixture into the coolant passage of the fuel cell;

vaporizing the coolant mixture to form a steam/fuel vapor mixture;

subjecting the steam/fuel vapor mixture to reaction conditions sufficient for generating a hydrogen-containing gas stream;

introducing the hydrogen-containing gas stream into the fuel cell anode inlet; and

condensing at least a portion of the cathode water vapor, separating the resulting liquid water stream from the cathode exhaust gas stream, and mixing the resulting liquid water stream with the hydrocarbon fuel stream.

Claim 125 (new): An electrical current generating system, comprising:

a fuel cell defining an anode inlet for receiving a hydrogen-containing gas stream, a coolant passage having a coolant inlet and a coolant outlet, and a cathode outlet for discharging a cathode exhaust gas stream;

a water source fluidly communicating the coolant inlet;

a hydrocarbon fuel source fluidly communicating with the coolant inlet;

a hydrogen gas generating module that includes an outlet for discharging a hydrogen-containing gas stream and a fuel inlet that fluidly communicates with the coolant outlet;

a first conduit fluidly communicating between the hydrogen gas generating module outlet and the fuel cell anode inlet;

a second conduit fluidly communicating between the fuel cell cathode outlet and the coolant inlet; and

a separator fluidly communicating with the second conduit for separating water from the cathode exhaust gas stream.

Claim 126 (new): The process according to claim 2, wherein the carbon monoxide-selective adsorbent comprises carbon fiber paper or carbon cloth.

Claim 127 (new): The process according to claim 27, wherein the carbon monoxide-selective adsorbent comprises carbon fiber paper or carbon cloth.

Claim 128 (new): The system according to claim 37, wherein the carbon monoxide-selective adsorbent comprises carbon fiber paper or carbon cloth.

Claim 129 (new): The system according to claim 91, wherein the carbon monoxide-selective adsorbent comprises carbon fiber paper or carbon cloth.

Claim 130 (new): The process according to claim 1, wherein at least one of the first adsorbent or second adsorbent comprises carbon fiber paper or carbon cloth.

Claim 131 (new): The process according to claim 130, wherein the carbon fiber paper or carbon cloth adsorbent is self-supporting.

Claim 132 (new): The system according to claim 31, wherein at least one of the first adsorbent or second adsorbent comprises carbon fiber paper or carbon cloth.

Claim 133 (new): The system according to claim 132, wherein the carbon fiber paper or carbon cloth adsorbent is self-supporting.

Claim 134 (new): The system according to claim 129, wherein the carbon fiber paper or carbon cloth adsorbent is self-supporting.

Claim 135 (new): A system for supplying hydrogen gas to a fuel cell anode, comprising:

a hydrogen gas generating system that can produce a hydrogen-containing gas that includes at least a first contaminant and a second contaminant;

a first contaminant separation zone configured to receive the hydrogen-containing gas and produce a partially purified hydrogen-containing gas;

at least one second contaminant separation zone configured to receive the partially purified hydrogen-containing gas and produce a substantially purified hydrogen-containing gas; and

at least one fuel anode configured to receive the substantially purified hydrogen-containing gas.

Claim 136 (new): The system according to claim 129, wherein at least one of the first contaminant separation zone or the second contaminant separation zone is disposed within a rotary pressure swing adsorption module.

Respectfully submitted,

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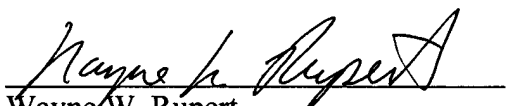
By 

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